CCD pedestal analysis

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Purpose

- Check the analysis software
- Determine the stability of the pedestal (over time)
- Find a source of noise hits in the SF system

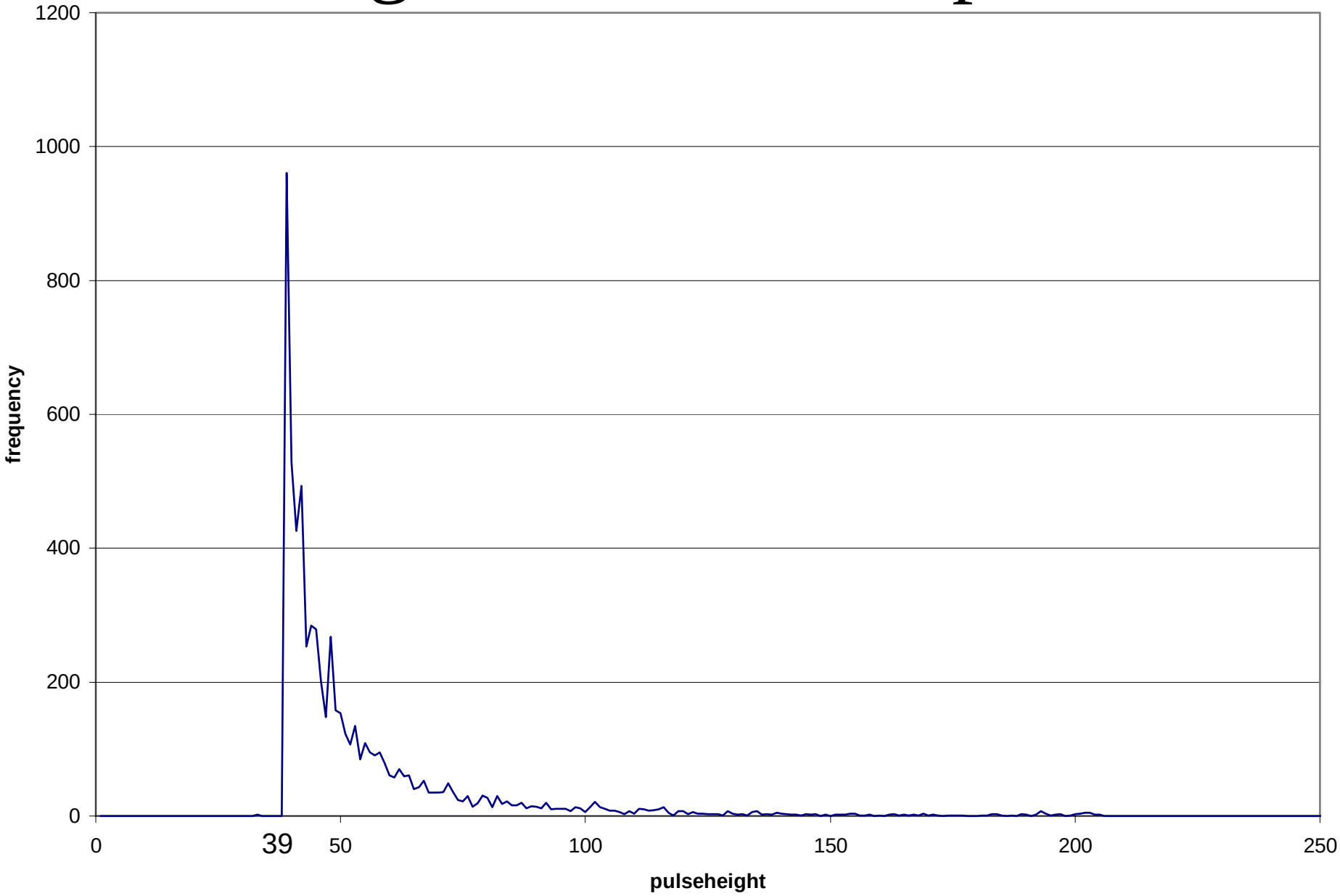
Goal

- Show that we should adjust the pedestal value used in the software
- Show that the software pedestal value has no effect on tracking/vertex finding

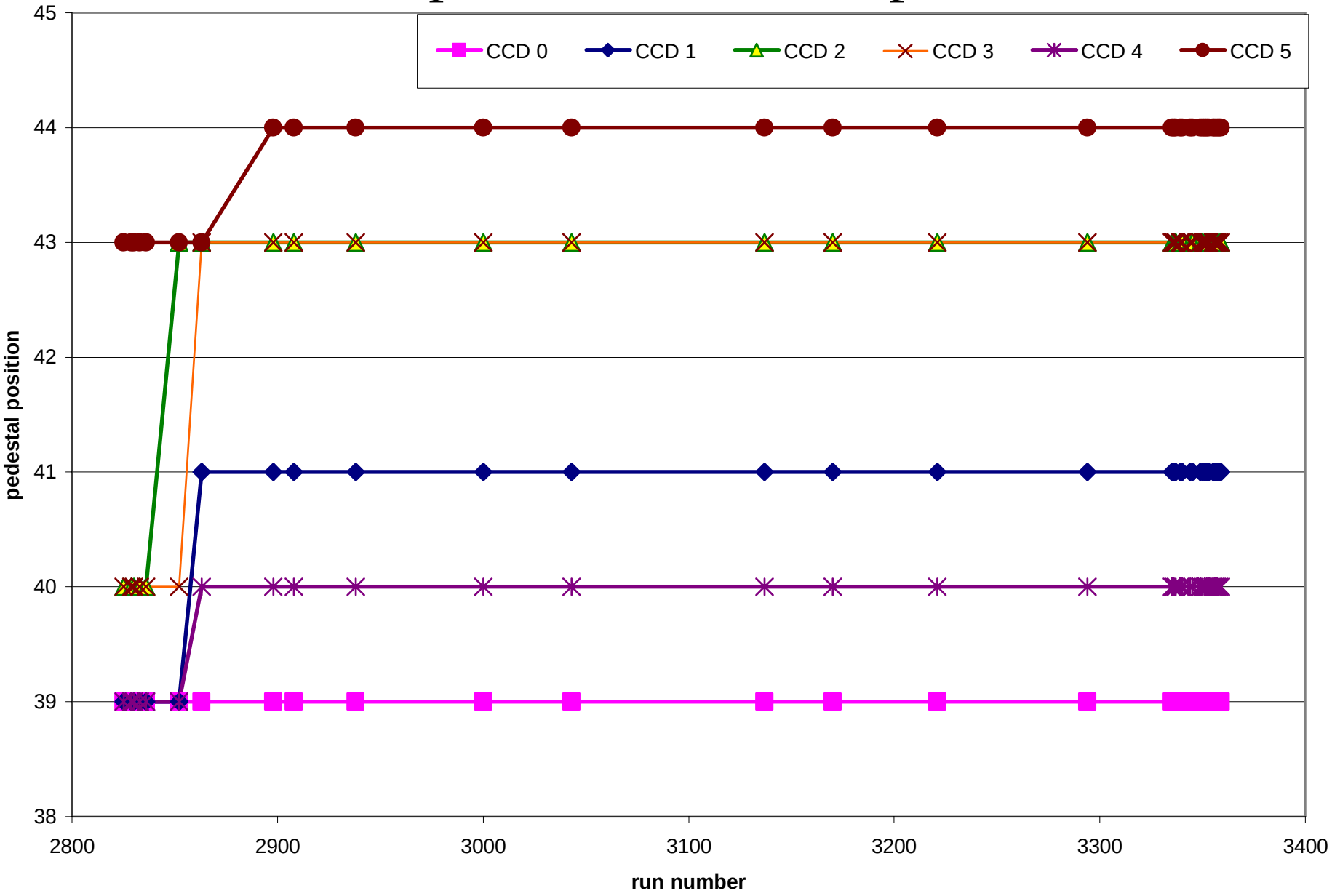
Method

- Histogram pulseheight for each CCD camera
- Extract the location of the pedestal
- Do this for several runs
- The CCD output is an 8-bit value (0-255)
- The pedestal value is fixed at 40 for each CCD in software

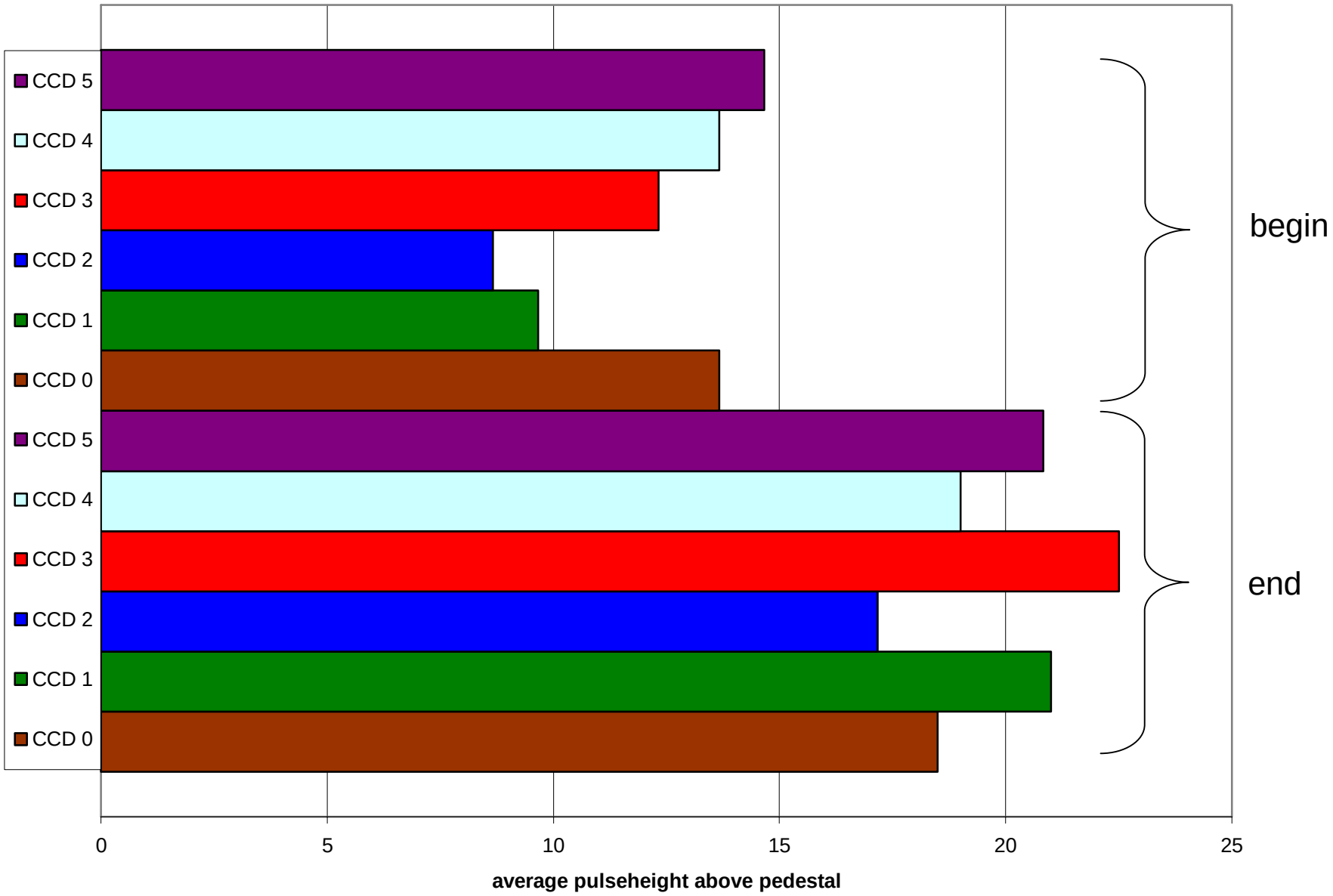
Histogram of CCD response



Time-dependence of CCD pedestals



Gain for the 6 CCDs,
before and after the pedestal-move



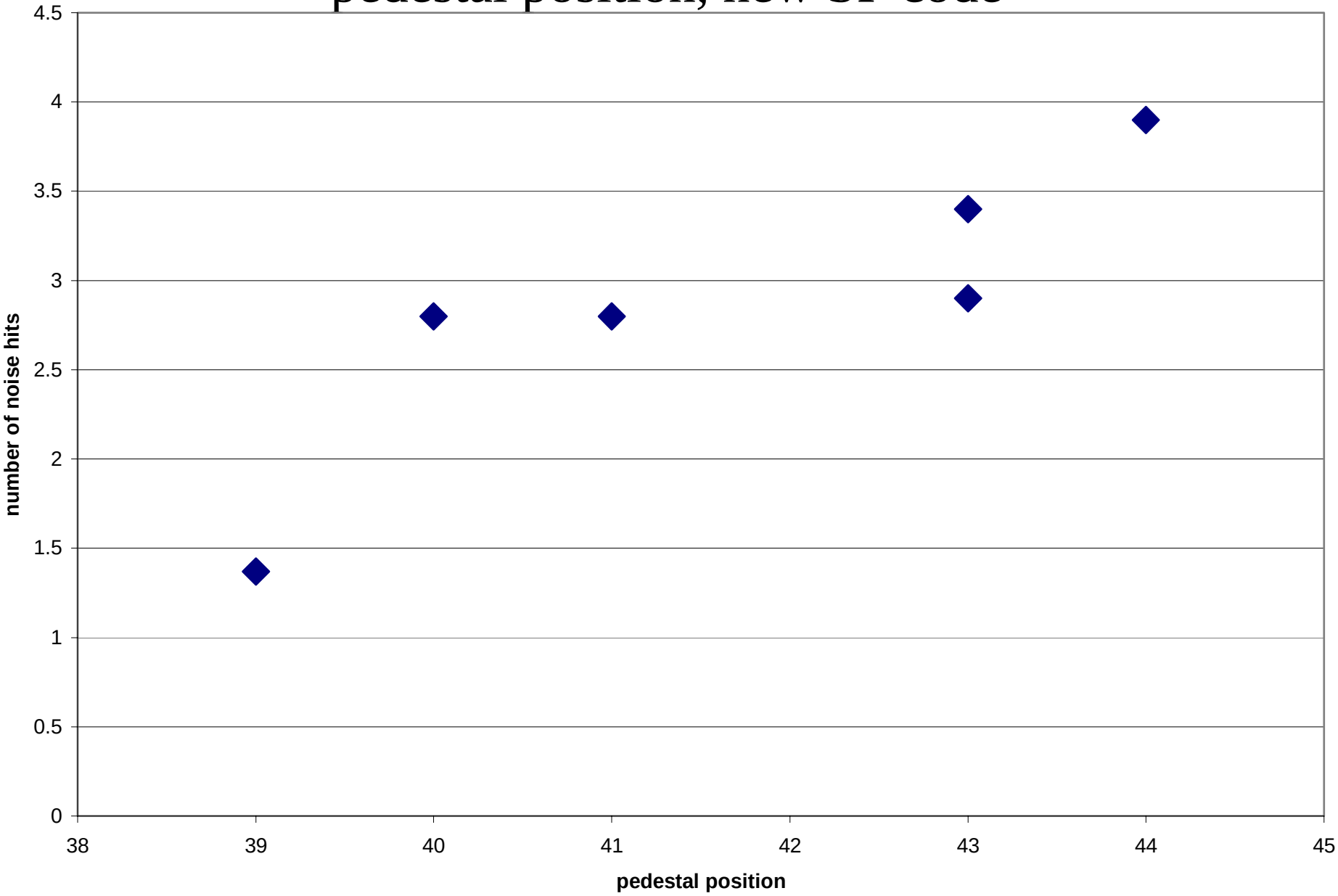
Effect on tracking

- The pedestal value is different for each CCD
- It is not 40
- All pedestals shift approximately at run 2860
- “Real hits” usually have a pulseheight of at least 20 per pixel
  - the plane efficiency is not affected
  - tracking is not affected
  - vertexing should not be affected

Background hits

- Due to the pedestal shift, more noise hits are present
  - low pulseheight hits in the old SF code
  - the cut of pixph>2 depends on the pedestal position in the new SF code

Number of noise hits in a muon run versus true pedestal position, new SF code



Conclusions and Outlook

- The pedestal position for the CCDs changes once during the run
- The pedestals for the six CCDs are not equal
  - this is not treated properly in the analysis software
- The analysis software will be updated